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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/758,804	01/11/2001	Candice A.C. Gardner	1318	9356

7590 12/11/2002

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EXAMINER

MEHTA, ASHWIN D

ART UNIT PAPER NUMBER

1638

DATE MAILED: 12/11/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/758,804	GARDNER ET AL.	
	Examiner	Art Unit	
	Ashwin Mehta	1638	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 30 September 2002.

2a) This action is FINAL. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-44 and 47-49 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) Claim(s) 1,2,4,6-8,21,23 and 25-27 is/are allowed.

6) Claim(s) 3,5,9-20,22,24,28-44 and 47-49 is/are rejected.

7) Claim(s) _____ is/are objected to.

8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.

12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some * c) None of:

1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) The translation of the foreign language provisional application has been received.

15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ .
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .	6) <input type="checkbox"/> Other: _____ .

DETAILED ACTION

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. The objection to claims 8 and 27 is withdrawn, in light of the claim amendments.
3. The rejection of claims 1-49 under the judicially created doctrine of obviousness-type double patenting is withdrawn, in light of the claim amendments.
4. The rejections of claims 1-49 under 35 U.S.C. 112, 2nd paragraph, are withdrawn in light of the claim amendments.
5. The rejection of claims 1-49 under 35 U.S.C. 112, 1st paragraph, requiring a deposit of seed, is withdrawn, in light of the claim amendments.

Claim Rejections - 35 USC § 112

6. Claims 3, 5, 22, 24, and 40-43 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 3 and 22: the recitation “wherein said plant has been manipulated to be male sterile” renders the claim indefinite. It is not clear if the claim is directed towards detasseled

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plants, or plants that have been transformed with a gene conferring male sterility. The following amendments are suggested: 1) in claims 3 and 22, replace “manipulated to be male sterile” with -detasseled--; 2) add a new claim 50 directed towards a method of producing a male sterile maize plant comprising transforming the maize plant of claim 2 or 21 with a transgene that confers male sterility, and a new claim 51 directed towards a transgenic male-sterile maize plant produced by the method of claim 50.

In claims 5 and 24: there is improper antecedent basis for “protoplasts” in line 1. It is suggested that the term be removed from the claims, and that a new claim be introduced directed towards protoplasts produced from the tissue culture of cells of claim 4 or 23.

In claim 40: the claim is indefinite because the recitation “comprising” in line 1 does not clearly indicate how many crosses are to be performed by the method. It is suggested that the recitation --F1 hybrid-- be inserted in claim 40, lines 1 and 6 before “maize”.

In claim 47: the recitation “essentially unchanged” in lines 2-3 renders the claims indefinite. It is not clear what is meant by this recitation. If the maize plant of claim 21 comprises further genes, then it is changed.

7. Claims 9-20, 28-44, and 47-49 remain rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention, for the reasons of record stated in the Office action mailed 05 June 2002 under item 6 for claims 1-49. Applicants traverse the

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rejection in the paper filed 30 September 2002. Applicants' arguments have been fully considered but were not found fully persuasive.

Applicants argue that the amendments to claims 3 and 22 obviate the rejection (response, paragraph bridging pages 11-12). The amendments do overcome the rejection, and the rejection has been withdrawn from claims 3 and 22.

Applicant argues that because of the linked genes fixed in PH6JM, one can cross PH6JM with another line, select a plant expressing at least 2 PH6JM traits and a trait from the other plant line (response, paragraph bridging pages 12-13). However, the other parent could also express the some of the same traits as PH6JM and pass it on to the progeny. Further, the traits inherited from the other parent are not known, since the description of the other parent is not provided.

Applicants argue that the fact that technical tools to fully describe the unique characteristics of the full genome of PH6JM do not exist does not make the progeny lines derived from them any less entitled to adequate patent protection. Applicants continue, indicating that if the Office now views traits as an unacceptable means of description, other means of description by those of ordinary skill in the art may be used to satisfy written description. Applicants draw analogy to *Ex Parte Tanksley*, in which the Board held that the manner in which Applicants describe their invention is at their discretion (response, paragraph bridging pages 13-14 and page 14, 1st full paragraph). Applicants continue, arguing that amended claims 17, 33, and 36 limit the progeny covered to those within two outcrosses from PH6JM, and to those of ordinary skill in the art, this indicates that a line that is fewer crosses away from a starting line will be, as a whole, more highly related to the starting line, and the work of the original breeder in developing the starting line will be retained in the closely related

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progeny (response, paragraph spanning pages 14-15). However, the progeny will also retain the material inherited from the other plants involved in the crosses, which are not described by the specification. The progeny plants would be closely related to the other parent as well.

Regarding Applicants' comment about the acceptance of traits by the Office to satisfy written description: Applicants are requiring the claimed progeny of the deposited line to express only two traits that also expressed by PH6JM. Clearly, plants express many more traits than just two. The traits enumerated in the claims are also not unique to PH6JM, and therefore describing a plant by saying that it expresses 2 particular traits does not distinguish it from any other plant that expresses the same traits.

Applicants also argue that the mere fact that progeny are not created fails to preclude their patentability, and possession can be shown by describing distinguishing identifying characteristics (response, page 15, 1st full paragraph). However, the claims indicate that only 2 traits need to be expressed, and these traits are expressed by other plants. The presence of the traits themselves does not distinguish the claimed plants from other plants that express them.

Applicant argues that pedigree is a distinguishing characteristic that is in compliance with written description guidelines (page 15, 1st full paragraph). However, a pedigree does not describe the morphological and physiological traits of an organism, especially when all of the ancestors of an organism are not described. Further, it is not clear how a plant that is twenty generations removed from PH6JM is described by it. Applicant argues that the genetics of PH6JM is described by the ATCC deposit of its seed, and by limiting the progeny to 2 or less outcrosses, the concern that the progeny are only distantly related to PH6JM is addressed (response, page 15, 1st full paragraph to the paragraph bridging pages 15-16). However, the

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deposit only describes PH6JM. It does not describe the morphological and physiological traits of any other plant. Further not all of the claims encompassing progeny plants are limited to 2 or less outcrosses.

Applicants argue that one of ordinary skill would know if PH6JM were utilized in a breeding program by looking at the breeding records, and that routine molecular techniques can be used to verify whether PH6JM is within the pedigree of a line. However, determination that PH6JM is an ancestor of a plant does not provide sufficient description of all of the morphological and physiological traits of that plant. Further, the specification does not describe any molecular determinants that one would need to identify any genetic material as having been derived from PH6JM. No description has been provided concerning molecular markers that are unique to the PH6JM genome, for example. Further, Applicants believe that the tools to fully describe the unique characteristics of the full genome of PH6JM do not exist.

Applicants emphasize that the influence of PH6JM cannot be removed from progeny that are 2 outcrosses removed from PH6JM, and the claimed progeny cannot be derived without the use of PH6JM as a parent. Applicants believe that this highlights the different perspective regarding claim scope between the Examiner and Applicant. Applicant contends that the Examiner's interpretation of the claims to progeny, as being of great breadth because a large number of plants could fall within its scope, ignores the essential limitation that only a plant developed through the use of PH6JM is within the scope of the claim (paragraph bridging pages 16-17). However, the influence of the other ancestors of the claimed progeny plants also cannot be removed. No description is provided at all as to the other ancestors, or the traits expressed by the progeny that are not expressed by PH6JM. As PH6JM is not the only ancestor of the

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progeny plants, the progeny necessarily express traits that are not expressed by PH6JM. Yet, no description is provided at all concerning those traits. Applicants argue that, to address the Examiner's concern that the PH6JM traits retained by the progeny may be derived from the non-PH6JM side of the pedigree, claim 14 has been amended to specify that the PH6JM traits were not derived from other plants used in the development of the claimed plant (response, page 17, 1st full paragraph). However, again, two traits are not sufficient to describe a plant. The plants of claim 14 express more than just 2 of the traits listed in the claim. Applicant has argued that PH6JM is unique, and that since PH6JM is described, that its descendants must also be described. However, while the combination of genes that produce PH6JM makes that line unique, Applicant does not provide any information as to why the genetic material itself unique. Applicant mentions that claims drawn to plants that contain a unique transgene make it allowable (paragraph bridging pages 13-14). However, Applicants here have not described the qualities of the genetic material of PH6JM that make it unique, other than references to the genetic material as a whole. As the claims are not limited to only self-crosses, all descendants do not inherit all of the genetic material of PH6JM. Descendants also inherit genetic material from other ancestors.

Applicants argue that SSR and RFLP techniques can be used to analysis F1 hybrids and determine if one of its parents is PH6JM, and cite Berry et al. for discussing the probability of identifying the parents of a hybrid by SSR data when neither parent is known (response, page 17, 2nd full paragraph). However, choices of possible parents were provided. Further, Applicants have not described any SSR, RFLP, or any other molecular markers that are unique to PH6JM. Applicants also note that a claim to the F1 hybrid made with a deposited line was expressly

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acknowledged by the United States Supreme Court In *J.E.M. Ag. Supply, Inc. v. Pioneer Hi-Bred Int'l, Inc.*, USPQ 2d 1865, 1873 (S.Ct. 2001) (response, page 17, last paragraph). However, this decision concerned an issue under 35 U.S.C. 101, not written description.

Applicants also argue, regarding claims drawn towards the deposited lines further comprising one or more transgenes or single gene conversions, that examples of traits and single gene conversions are given in the specification. Applicants argue that even if more than one trait is affected by the transgene, that the genetics of PH6JM is only minimally affected, and argue that insertion of one or a few genes into a genome that is estimated to have over 50,000 to 80,000 genes is a minor change (response, page 18, 2nd full paragraph). However, Applicants are not considering the effect of the transgene on the morphological and physiological traits of PH6JM. Even the novice in the art would recognize that even a single gene could potentially have a significant effect on a plant. That the addition of a few more nucleotide sequences to the genome of PH6JM fails to significantly add to the total number of nucleotides, is not the point. The transgenes may be of any gene, including those that affect more than one trait. The morphological and physiological characteristics of any such plant are not described. For example, a transgene that is a transcription factor can effect more than just one gene, and multiple traits. Such plants would express different morphological and physiological traits from PH6JM, which are not described. It is suggested that claims 11 and 30 be amended to list the types of transgenes contemplated in the specification, for example disease or pest resistance genes, provided the prior art teaches those isolated genes.

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Applicants also argue, regarding the method claims, that the methods are fully described (paragraph bridging pages 18-19). However, the progeny plants of PH6JM that are required in the methods that are not described, and those plants are a part of the claimed methods.

7. Claims 18-20 and 47-49 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The claims are broadly drawn towards maize plant PH6JM or a maize plant having all the morphological and physiological characteristics of PH6JM, further comprising one or more single gene conversions.

The specification teaches that single gene conversions, or introgression, of the disclosed maize plant through traditional breeding is contemplated (page 21, lines 15-30). However, the specification does not teach any PH6JM plants comprising single gene conversions. It is not clear that single genes may be introgressed into the genetic background of a plant through traditional breeding. Hunsperger et al. (US Patent No. 5,523, 520), Kraft et al. (*Theor. Appl. Genet.*, 2000, Vol. 101, pages 323-326), and Eshed et al. (*Genetics*, 1996, Vol. 143, pages 1807-1817), for example, teach that it is unpredictable whether the gene or genes responsible for conferring a phenotype in one plant genotypic background may be introgressed into the genetic background of a different plant, to confer a desired phenotype in said different plant. Hunsperger et al. teach that the introgression of a gene in one genetic background in any plant of the same species, as performed by sexual hybridization, is unpredictable in producing a single

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gene conversion plant with a desired trait (column 3, lines 26-46). Kraft et al. teach that linkage disequilibrium effects and linkage drag prevent the making of plants comprising a single gene conversion, and that such effects are unpredictably genotype specific and loci-dependent in nature (page 323, column 1, lines 7-15). Kraft et al. teach that linkage disequilibrium is created in breeding materials when several lines become fixed for a given set of alleles at a number of different loci, and that very little is known about the plant breeding materials, and therefore it is an unpredictable effect in plant breeding (page 323, column 1, lines 7-15). Eshed et al. teach that in plants, epistatic genetic interactions from the various genetic components comprising contributions from different genomes may affect quantitative traits in a genetically complex and less than additive fashion (page 1815, column 1, line 1 to page 1816, column 1, line 1). In the absence of further guidance, undue experimentation would be required by one skilled in the art to overcome the difficulties and unpredictability of single gene conversions taught in the prior art.

8. Claim 14 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The claim is broadly drawn towards any maize plant, or parts thereof, wherein at least one ancestor is a plant of line PH6JM, expresses a combination of at least 2 traits that are not significantly different from PH6JM when determined at the 5% significant level and when grown in the same environmental conditions, and where the traits were derived from PH6JM and not from other plants utilized in the development of said plant.

The specification teaches the morphological and physiological characteristics of maize plant PH6JM (page 17, line 3 to page 20, line 50).

However, the specification does not teach how one may determine that a descendent of PH6JM, that expresses at least 2 of the traits enumerated in claim 14, could only have derived those traits from PH6JM. The specification does not teach any determinants, such as molecular markers, that are unique to PH6JM and linked to the genes that govern the traits, that one skilled in the art would need in order to determine that the traits could only have been derived from PH6JM. Further, the specification does not teach the genes that govern the traits. It is not clear how one can determine that the traits could only have been derived from PH6JM if the specification does not teach the genes that govern the expression of those traits. Further, Applicant believes that the tools to fully describe the unique characteristics of the full genome of PH6JM do not exist (response received 30 September 2002, page 13, 2nd full paragraph). In the absence of further guidance of these unique characteristics, undue experimentation would be required by one skilled in the art to determine that the genetic material of the claimed plant governing the traits enumerated in the claim was derived from PH6JM and not from any other ancestor that also expresses those traits. See Genentech, Inc. V. Novo Nordisk, A/S, 42 USPQ2d 1001, 1005 (Fed. Cir. 1997), which teaches that “the specification, not the knowledge of one skilled in the art” must supply the enabling aspects of the invention. Given the breadth of the claim, unpredictability of the art and lack of guidance of the specification as discussed above, undue experimentation would be required by one skilled in the art to make and use the claimed invention.

Claim Rejections - 35 USC § 102 & 103

9. Claims 17, 33, 36, 41, and 43 remain rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Kramer (U.S. Patent No. 6,124,534), for the reasons of record stated in the Office action mailed 27 March 2002 under item 9. Applicant traverses the rejection in the paper received 27 August 2002. Applicant's arguments and the claim amendments were fully considered and found persuasive for claims 1-16, 18-32, 34, 35, 37-40, 42, 44, and 47-49. Claims 45 and 46 have been cancelled.

Applicant argues that claims 17 and 36 have been limited to a plant two crosses away from PH3AV, and that if an independent claim is non-obvious, any claim depending therefrom must be non-obvious (response, page 20, 4th full paragraph). However, claims 17 and 36 are product-by-process claims, which may be properly rejected over prior art teaching the same product produced by a different process. See In re Thorpe, 227 USPQ 964,966 (Fed. Cir. 1985).

Applicants argue that the plants of claims 41 and 43 are one-cross removed from PH3AV (response, paragraph spanning pages 20-21). However, parent claim 40 does not clearly indicate that the method is only for producing F1 generation plants. It is suggested that claim 40 be amended as discussed above.

10. Claims 1, 2, 4, 6-8, 21, 23, and 25-27 are allowed. Claims 3, 5, 9-20, 22, 24, 28-44 and 47-49 are rejected.

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Contact Information

Any inquiry concerning this or earlier communications from the examiner should be directed to Ashwin Mehta, whose telephone number is 703-306-4540. The examiner can normally be reached on Mondays-Thursdays and alternate Fridays from 8:00 A.M to 5:30 P.M. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amy Nelson, can be reached at 703-306-3218. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3014 and 703-872-9306 for regular communications and 703-872-9307 for After Final communications. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0196.

December 9, 2002


ASHWIN D. MEHTA, PH.D
PATENT EXAMINER